

THAT WHICH IS CLAIMED:

1. An apparatus adapted to measure a property of a cigarette paper wrapper, said apparatus comprising:
  - a sampling device defining a first chamber portion and a corresponding second chamber portion, the first and second chamber portions engaging at and defining a sampling area, the sampling device being configured to receive the cigarette paper wrapper such that the cigarette paper wrapper spans the sampling area and separates the first chamber portion from the second chamber portion;
  - a first gas source configured to supply a regulated flow of a carrier gas to the first chamber portion;
  - a second gas source configured to supply a regulated flow of a detectable gas to the second chamber portion; and
  - an analyzer device in communication with the first chamber portion and configured to receive a resultant gas flow, the resultant gas flow including the carrier gas and any of the detectable gas entering the first chamber portion through the cigarette paper wrapper, the analyzer device being further configured to be capable of determining an amount of the detectable gas in the resultant gas flow so as to thereby determine a property of the cigarette paper wrapper.
2. An apparatus according to Claim 1 further comprising a mass flow meter operably engaged between each of the first and second gas sources and the first and second chamber portions, respectively, the respective mass flow sensors being adjustable to regulate the flows of the carrier gas and the detectable gas such that substantially equal mass flows thereof are supplied to the first and second chamber portions, respectively.
3. An apparatus according to Claim 1 wherein the cigarette paper wrapper is provided as a roll of paper wrapper having regularly repeating contiguous first and second bands, each band having a defined area and the first band and the second band

having different values of a common property, and the sampling device is further configured such that the sampling area is smaller than the respective defined areas of the first and second bands.

4. An apparatus according to Claim 3 further comprising an advancement device configured to selectively advance the paper wrapper from the roll and through the sampling device.

5. An apparatus according to Claim 4 further comprising a sensor operably engaged with the advancement device and configured to be capable of directing the advancement device to selectively stop the advancement of the paper wrapper through the sampling device such that only one of the first and second bands spans the sampling area.

6. An apparatus according to Claim 5 further comprising a sensor operably engaged with at least the analyzer device and configured to direct the analyzer device to determine the amount of the detectable gas in the resultant gas flow at least when the advancement of the paper wrapper through the sampling device is stopped and only one of the first and second bands spans the sampling area.

7. An apparatus according to Claim 1 wherein the analyzer device is further configured to be capable of determining a diffusion coefficient of the cigarette paper wrapper with respect to the detectable gas.

8. An apparatus according to Claim 1 wherein the carrier gas is a substantially inert gas.

9. An apparatus according to Claim 1 wherein the detectable gas is substantially harmless and capable of being released to atmosphere from the second chamber portion.

10. An apparatus according to Claim 1 wherein the analyzer device is further configured to determine when the amount of the detectable gas in the resultant gas flow reaches an equilibrium.

11. A method of measuring a property of a cigarette paper wrapper, said method comprising:

receiving a cigarette paper wrapper in a sampling device defining a first chamber portion and a corresponding second chamber portion, the first and second chamber portions engaging at and defining a sampling area, the sampling device being configured to receive the cigarette paper wrapper such that the cigarette paper wrapper spans the sampling area and separates the first chamber portion from the second chamber portion;

supplying a regulated flow of a carrier gas to the first chamber portion;

supplying a regulated flow of a detectable gas to the second chamber portion;

receiving a resultant gas flow at an analyzer device in communication with the first chamber portion, the resultant gas flow including the carrier gas and any of the detectable gas entering the first chamber portion through the cigarette paper wrapper; and

determining, with the analyzer device, an amount of the detectable gas in the resultant gas flow so as to thereby determine a property of the cigarette paper wrapper.

12. A method according to Claim 11 further comprising regulating the flows of the carrier gas and the detectable gas with a mass flow meter operably engaged between each of the first and second gas sources and the first and second chamber portions, respectively, such that substantially equal mass flows of the carrier and detectable gases are supplied to the first and second chamber portions, respectively.

13. A method according to Claim 11 further comprising supplying the cigarette paper wrapper as a roll of paper wrapper having regularly repeating contiguous

first and second bands, each band having a defined area and the first band and the second band having different values of a common property.

14. A method according to Claim 13 wherein receiving the cigarette paper wrapper in the sampling device further comprises receiving the cigarette paper wrapper in a sampling device having a sampling area is smaller than the respective defined areas of the first and second bands.

15. A method according to Claim 13 further comprising selectively advancing the paper wrapper from the roll and through the sampling device with an advancement device.

16. A method according to Claim 15 further comprising directing the advancement device to selectively stop the advancement of the paper wrapper through the sampling device, with a sensor operably engaged with the advancement device, such that only one of the first and second bands spans the sampling area.

17. A method according to Claim 16 further comprising directing the analyzer device to determine the amount of the detectable gas in the resultant gas flow, with a sensor operably engaged with at least the analyzer device, at least when the advancement of the paper wrapper through the sampling device is stopped and only one of the first and second bands spans the sampling area.

18. A method according to Claim 11 wherein determining an amount of the detectable gas in the resultant gas flow further comprises determining an amount of the detectable gas in the resultant gas flow so as to determine a diffusion coefficient of the cigarette paper wrapper with respect to the detectable gas.

19. A method according to Claim 11 wherein supplying a regulated flow of a carrier gas further comprises supplying a regulated flow of a substantially inert gas.

20. A method according to Claim 11 wherein supplying a regulated flow of a detectable gas further comprises supplying a regulated flow of a substantially harmless gas capable of being released to atmosphere from the second chamber portion.

21. A method according to Claim 11 wherein determining an amount of the detectable gas in the resultant gas flow further comprises determining an amount of the detectable gas in the resultant gas flow when the amount of the detectable gas in the resultant gas flow reaches an equilibrium.